Community Multiscale Air Quality Modeling System

A 2022 Research Impact Metrics Analysis

CMAQ TEAM
U.S. ENVIRONMENTAL PROTECTION AGENCY



Report Prepared by the EPA-RTP Library

UNC Contractors

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CONTENTS

ABOUT THIS REPORT	2
KEY METRICS & TAKEAWAYS	3
PUBLICATION ANALYSIS	4
Journals and Research Areas	4
Funding and Collaborating Organizations	5
Author Keywords and Topics	7
Citation Topics	8

ABOUT THIS REPORT

This report presents a summary-level bibliometric analysis of the 2022 publications which referred to the Community Multiscale Air Quality Modelling System, or CMAQ. The dataset was generated by a search in the Web of Science Core Collection and All Databases records using the following strategy:

TOPIC=(CMAQ OR "community multiscale air quality" OR "community multi-scale air quality")

where the "TOPIC" field (TS) searches the Web of Science Core Collection records in the title, abstract, keywords, and Keywords Plus® fields.¹

The results (n=194) were collected on 10 January 2023 Analysis was completed using Web of Science Analyze and Citation Report features and InCites. More information about the methodology used and a full listing of the publications evaluated in this report are available upon request to johnson.taylor@epa.gov.

¹ Web of Science Core Collection Help: Advanced Search Field Tags. Accessed from http://webofscience.help.clarivate.com/Content/wos-core-collection/woscc-search-field-tags.htm

KEY METRICS & TAKEAWAYS

CMAQ KEY METRICS & TAKEAWAYS

ON THE WEB AND IN THE LITERATURE

194 d

dataset papers



25 research areas



50 source titles

Top Journal
SCIENCE OF THE
TOTAL
ENVIRONMENT
by number of

citing articles

CMAS Center

189 DOWNLOADS

Zenodo



923 DOWNLOADS (ALL VERSIONS)

Impact Factor: **10.754**

GitHub



175 FORKS 123 UNIQUE CLONES

News platforms



in 2022 or 2023

17 MENTIONS

Top Org Types:

- · academic/univ systems
- · research institutes
- government
- nonprofit

The dataset has already received **216** citations

with 55% documents cited

Mentioned by



1047 authors

across **239** organizations



28 countries



166 papers referencing CMAQ in 2022 were **funded entirely by non-US sources**. Organizational addresses in other countries included China, South Korea, United Kingdom, Japan, Taiwan, Belgium, Bulgaria, Canada, Germany, and Hong Kong.



While most key terms were related to air research and health effects, 2022 publications mentioning CMAQ touched on **wildfires**, **transportation**, and **land use**.



Of the 2022 authors who referenced CMAQ, as indexed in the Core Collection, over **97%** were **not affiliated with EPA.**



According to InCites data, **academic organizations** comprise **74%** of institutional affiliations for the 2022 papers mentioning CMAQ.

PUBLICATION ANALYSIS

The following section assesses the 2022 publications comprising the dataset resulting from the CMAQ search detailed on page 2. For clarity, the figures showing the number of publications per research area, journal, institution, and funding agency only list the top 10 results in each category or next tie-breaking threshold.

Journals and Research Areas

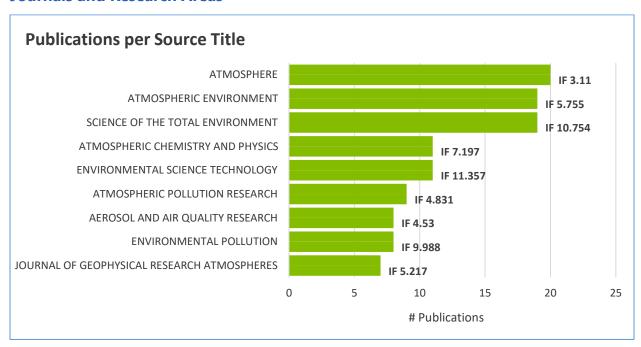


Figure 1: Number of CMAQ publications per journal in Web of Science All Databases with the Journal Impact Factor from JCR.

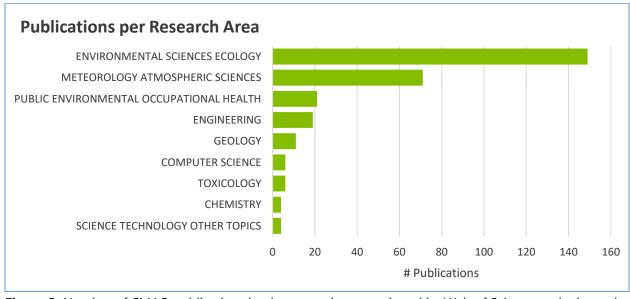


Figure 2: Number of CMAQ publications by the research area assigned by Web of Science to the journals in which the articles were published. These categories are not mutually exclusive.

Funding and Collaborating Organizations

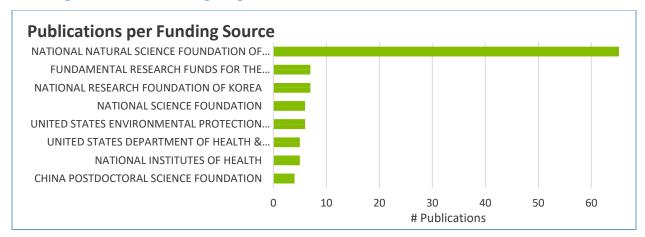


Figure 3: Number of publications per InCites-indexed funding source.

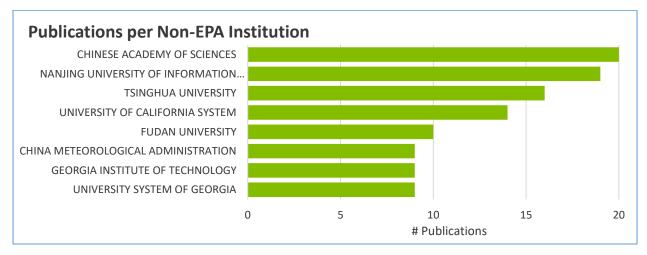


Figure 4: Number of CMAQ publications per non-EPA author-affiliated organization. Articles are counted for an institution if at least one of the article's authors lists that institution as their affiliation. Compiled from Web of Science Core Collection data.

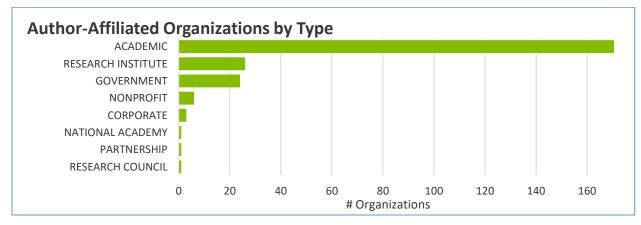


Figure 5: Number of author-affiliated organizations by type of organization. Each institution has been listed by at least one author in the set as an affiliation. Compiled from InCites data.

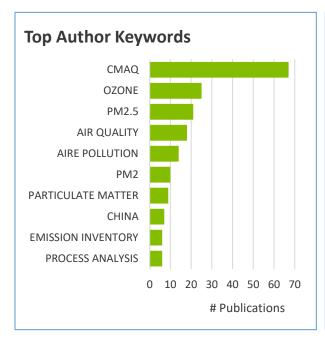


Figure 6: Distribution of CMAQ publications per co-authoring country. Publications are counted for an institution if at least one of the article's authors lists that country as their affiliated institution's address. Compiled from Web of Science data.

Country	Papers	Country	Papers
CHINA	97	VIETNAM	3
USA	75	GERMANY	2
SOUTH KOREA	25	AUSTRIA	1
UNITED KINGDOM	7	CHILE	1
TAIWAN	7	CZECH REPUBLIC	1
JAPAN	6	FINLAND	1
AUSTRALIA	4	GREECE	1
CANADA	4	IRELAND	1
INDIA	4	ISRAEL	1
MALAYSIA	4	ITALY	1
BRAZIL	3	NETHERLANDS	1
BULGARIA	3	SINGAPORE	1
FRANCE	3	SWITZERLAND	1
SPAIN	3	THAILAND	1

Table 1: Number of publications by country according to author affiliations. Compiled from Web of Science All Databases data.

Author Keywords and Topics





Figures 7 and 8: Top 10 author-provided keywords from the Web of Science Core Collection with terms with a frequency greater than 3 displayed in a word cloud powered by WordArt.com.

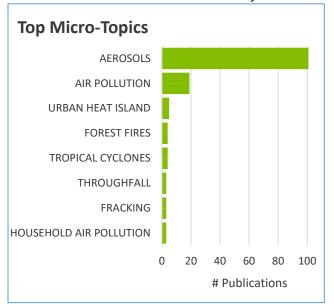




Figures 9 and 10: Top 10 KeyWords Plus terms from the Web of Science Core Collection with terms with a frequency greater than 3 displayed in a word cloud powered by WordArt.com.

Citation Topics

Citations Topics² is a new schema available in InCites that algorithmically analyzes articles to create clusters based on cited and citing relationships between documents. The schema is a three-level hierarchical classification system consisting of macro-, meso-, and micro-topics.





Figures 11 and 12: Top 8 Micro Citation Topics from Incites with all micro topics displayed in a cloud powered by WordArt.com.

Macro-Topics	Meso-Topics	Micro-Topics	# Pubs
3 AGRICULTURE, ENVIRONMENT & ECOLOGY	3.45 SOIL SCIENCE	3.40.1598 FOREST FIRES	4
6 SOCIAL SCIENCES	6.115 SUSTAINABILITY SCIENCE	6.115.234 ENVIRONMENTAL KUZNETS CURVE	2
	6.153 CLIMATE CHANGE	6.153.2168 ENVIRONMENTAL JUSTICE	2
8 EARTH SCIENCES	8.124 ENVIRONMENTAL SCIENCES	8.124.10 AEROSOLS	106
		8.124.1775 FRACKING	3
		8.124.2044 DIMETHYLSULFONIOPROPIONATE	2
		8.124.2192 HOUSEHOLD AIR POLLUTION	3
		8.124.552 AIR POLLUTION	19
	8.19 OCEANOGRAPHY, METEOROLOGY, &	8.19.113 TROPICAL CYCLONES	4
	ATMOSPHERIC SCIENCES	8.19.743 URBAN HEAT ISLAND	5

Table 2. A table mapping macro-topics to their respective meso-topics and micro-topics as indexed in InCites.

² For more information about Citation Topics, visit: https://incites.help.clarivate.com/Content/Research-Areas/citation-topics.htm